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EXAMINER
VERDIER, CHRISTOPHER M

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/628,330	MIURA ET AL.	
	Examiner	Art Unit	
	Christopher Verdier	3745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 January 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) *7-9 and 18-20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,10-17,21 and 22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *7-29-03, 1-17-06* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Applicant's amendment dated January 17, 2006 has been carefully considered but is non-persuasive. Claims 1-22 are pending, with claims 7-9 and 18-20 being withdrawn from further consideration as being drawn to a non-elected species. The Replacement Sheet of drawings for figures 18-19 is accepted by the examiner. The specification has been amended to correct the informalities set forth in the Office action of October 17, 2005. The claims have been amended to correct the informalities set forth in the Office action of October 17, 2005. Correction of these matters is noted with appreciation.

Applicant has amended independent claim 1 to recite that the pump casing further defines a first discharge port and a second discharge port respectively communicating with the first pump channel and the second pump channel and formed separately from each other, so that the fluid is discharged from the first and second channels via respective first and second discharge ports and is converged at the convergence device. Applicant has amended independent claim 14 to recite that the first discharge port and the second discharge port are formed separately from each other in the pump casing. Applicant has argued in response to these amendments that these arrangements provide for reliably canceling the pulsation of the fluid discharge from the first discharge port and from the second discharge port when the fluid converges at the convergence device. However, these amended features are disclosed by Applicant's Admitted Prior Art Figures 23-24 (AAPA Figures 23-24). These figures disclose that the pump casing 104 further defines a first discharge port 153 and a second discharge port 173 respectively communicating with the first pump channel 151 and the second pump channel 171 and formed separately from each other, so that the fluid is discharged from the first and second channels via the respective

first and second discharge ports and is converged at the convergence device (the unnumbered channel within which the impeller rotates). Sakamoto 6,443,692 is relied upon to teach a pulsation canceling device, and the combination of AAPA Figures 23-24 with Sakamoto will inherently result in cancellation of the pulsation of the fluid discharge from the first discharge port and from the second discharge port when the fluid converges at the convergence device.

With regard to Applicant's argument that Sakamoto is silent as to a definite reason why the grooves on the first side of the impeller are shifted by half the pitch of the grooves from the position of the grooves on the second side of the impeller, the examiner respectfully disagrees. This groove pitch shifting arrangement is similar to Applicant's disclosed arrangement and inherently will provide for reduction of noise. With regard to Applicant's argument that the arrangement of Sakamoto does not allow for controlling the flow of the fluid to enable effective cancellation of the pulsations, the examiner respectfully disagrees because this groove pitch shifting arrangement is similar to Applicant's disclosed arrangement and inherently will provide for cancellation of the pulsations.

With regard to Applicant's arguments that although Fuji may teach an impact reducing device, a person of ordinary skill in the art would not combine this reference with Sakamoto to arrive at the claimed invention because Sakamoto does not teach the pulsation canceling device in conjunction with the convergence device and the controlled flow of fluid from the first and second pumps chambers via the separated first and second discharge ports, and that the prior art references do not disclose any motivation to combine the impact reducing device and the

pulsation canceling device to achieve the synergistic action for effectively reducing the noises, the examiner disagrees. The base invention is disclosed by AAPA Figures 23-24, with the exception of the pulsation canceling device and the impact reducing device. However, both the pulsation canceling device and the impact reducing device are well-known features as taught by Sakamoto and Fuji, respectively. Sakamoto teaches that the pulsation canceling device is provided for the purpose of reducing noise, and Fuji teaches that the impact reducing device is provided for the purpose of allowing fluid to be smoothly discharged from the discharge port, reducing the amount of fluid that collides with the terminal end of the discharge port and reducing noise. The Court of Appeals for the Federal Circuit stated in *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1540, 218 USPQ 871, 880 (Fed. Cir. 1983) that "A requirement for "synergism" or a "synergistic effect" is nowhere found in the statute, 35 U.S.C. When present, for example in a chemical case, synergism may point toward nonobviousness, but its absence has no place in evaluating the evidence on obviousness. The more objective findings suggested in Graham, supra, are drawn from the language of the statute and are fully adequate guides for evaluating the evidence relating to compliance with 35 U.S.C. § 103. *Bowser Inc. v. United States*, 388 F. 2d 346, 156 USPQ 406 (Ct. Cl. 1967)."

With regard to Applicant's argument that figures 1-3 of Rollwage 6,527,507 do not show the impact reducing device and the pulsation canceling device, Applicant is correct. However, Rollwage is not relied upon to teach these features, but rather an impeller 18 with communication holes 36 defined in the impeller that communicate between a pair of grooves 22 defined in a first and second surface of the impeller, and opposing to each other in the axial

direction, for the purpose of providing a low or small force in the direction of the rotary axis with which the impeller is pressed against a sidewall of the casing.

Claim Objections

Claims 1-6 and 10-13 are objected to because of the following informalities: Appropriate correction is required.

In claim 1, third to last line, -- the -- should be inserted after "via".

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-4, 6, 10-11, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants' Admitted Prior Art Figures 23-24 in view of Sakamoto 6,443,692 and Fuji 6,336,788. Applicants' Admitted Prior Art Figures 23-24 (AAPA Figures 23-24) discloses an impeller pump for a fluid substantially as claimed, including a rotary impeller 110, a pump casing 104 defining a first pump channel 151 and a second pump channel 171, wherein the rotary impeller is disposed within the pump casing and opposes to the first pump channel and the second pump channel, respectively, a convergence device (the unnumbered channel within which the impeller rotates) arranged and constructed to converge the fluid discharged from the first pump channel and the fluid discharged from the second pump channel. The pump casing further defines a first discharge port 153 and a second discharge port 173 respectively communicating with the first pump channel 151 and the second pump channel 171 and formed separately from each other, so that the fluid is discharged from the first and second channels via the respective first and second discharge ports and is converged at the convergence device. The rotary impeller has a first surface and a second surface opposing to each other, each of the first and second surfaces includes a plurality of grooves 112 arranged in a circumferential direction of the impeller and spaced from each other by a predetermined pitch, with the first pump channel opposing the grooves of the first surface of the impeller, the first pump channel communicating with a first suction port 152 and a first discharge port 153, and the first suction port and the first discharge port are separated from each other by a first partition wall 105a, the second pump channel opposes the grooves of the second surface of the impeller, the second pump channel communicating with a second suction port 172 and a second discharge port 173, and the second suction port and the second discharge port are separated from each other by a second partition

wall 107a, the convergence device comprising a convergence channel communicating with the first discharge port and the second discharge port, so that the fluid discharged from the first discharge port and the fluid discharged from the second discharge port converge at the convergence channel. The first discharge port and the second discharge port are disposed at the same position in the circumferential direction of the impeller. The first pump channel and the second pump channel include unnumbered terminal ends that communicate with the first discharge port and the second discharge port, respectively, and an unnumbered motor section that rotates the impeller.

However, AAPA Figures 23-24 does not disclose a pulsation canceling device arranged and constructed to cancel pulsations of the fluid discharged from the first pump channel and the second pump channel, respectively (claim 1), does not disclose an impact reducing device arranged and constructed to reduce impacts produced by at least one of the flow of the fluid from the first pump channel and the flow of the fluid from the second channel (claim 1), does not disclose the pulsation canceling device being arranged and constructed to cancel pulsations of the fluid discharged from the first discharge port and the second discharge port (claim 2), does not disclose the impact reducing device is arranged and constructed to reduce impacts of the fluid caused by change of direction of at least one of a flow of the fluid discharged from the first pump channel toward the first discharge port and a flow of the fluid discharged from the second pump channel toward the second discharge port (claim 2), does not disclose that the pulsation canceling device is arranged and constructed to shift a phase of the pulsation of the fluid discharged from the first discharge port from a phase of the pulsation of the flow of the fluid

discharged from the second discharge port (claim 3), does not disclose that the pulsation canceling device is arranged and constructed to displace the grooves of the impeller defined in the first surface from the grooves defined in the second surface by a half the predetermined pitch (claim 4), does not disclose that each of the terminal ends has a part opposing to the grooves defined in the corresponding one of the first and second surfaces of the impeller such that the impact reducing device is arranged and constructed to gradually reduce a sectional area of the part of the terminal end in the rotational direction of the impeller (claim 6), does not disclose that the impact reducing device comprises a depth decreasing region disposed at one of the terminal ends of the first and second pump channels, with the depth decreasing region configured to gradually reduce the depth of the part of at least one of the terminal ends in the rotational direction (claim 10), and does not disclose that the depth decreasing region comprises an inclined surface opposing to the grooves defined in the corresponding ones of the first and second surfaces of the impeller, with the inclined surface being inclined in the rotational direction of the impeller (claim 11).

Sakamoto (figures 1-8) shows a regenerative channel pump having a pulsation canceling device arranged and constructed to cancel pulsations of fluid discharged from a first bottom pump channel near 6 and a second top pump channel near 6, with the pulsation canceling device being arranged and constructed to cancel pulsations of the fluid discharged from a first discharge port 34, with the pulsation canceling device being arranged and constructed to displace grooves 12 of the impeller defined in a first surface from grooves 12 defined in a second surface of the impeller by a half a predetermined pitch, for the purpose of reducing pulsations and noise.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to form the impeller of AAPA Figures 23-24 such that the grooves of the impeller defined in the first surface are offset from the grooves defined in the second surface of the impeller by a half the predetermined pitch, as taught by Sakamoto, for the purpose of reducing pulsations and noise. This modification would inherently result in the cancellation of pulsations of the fluid discharged from the first discharge port and the second discharge port, and the shifting of a phase of the pulsation of the fluid discharged from the first discharge port from a phase of the pulsation of the flow of the fluid discharged from the second discharge port.

Fuji '788 (figures 1-7) shows a regenerative channel pump having an impact reducing device 24f arranged and constructed to reduce impacts produced by flow of the fluid from a first pump channel 21 with the impact reducing device being arranged and constructed to reduce impacts of the fluid caused by change of direction of a flow of the fluid discharged from the first pump channel toward a first discharge port 24, with an unnumbered terminal end having the part 24 opposing to grooves 16a defined in the corresponding one of first and second surfaces of the impeller 16 such that the impact reducing device is arranged and constructed to gradually reduce a sectional area of the part of the terminal end in the rotational direction of the impeller, with the impact reducing device comprising a depth decreasing region disposed at one of the terminal ends of the first pump channels, with the depth decreasing region configured to gradually reduce the depth of the part of at least one of the terminal ends in the rotational direction, with the depth decreasing region comprising an inclined surface opposing to the grooves defined in the

impeller, with the inclined surface being inclined in the rotational direction of the impeller, for the purpose of allowing fluid to be smoothly discharged from the discharge port, reducing the amount of fluid that collides with the terminal end of the discharge port and reducing noise.

It would have been further obvious at the time the invention was made to a person having ordinary skill in the art to form the modified impeller of AAPA Figures 23-24 such that it includes an impact reducing device of the form taught by Fuji, for the purpose of allowing fluid to be smoothly discharged from the discharge port, reducing the amount of fluid that collides with the terminal end of the discharge port and reducing noise. With regard to claim 6, which recites that each of the first discharge port and second discharge port have the impact reducing device in the form of the part opposing the groove in the first and second surfaces of the impeller, and claim 11, which recites that the depth decreasing region is an inclined surface opposing to the grooves defined in the first and second surfaces of the impeller, these are duplications of a known part for a known function. It would have been further obvious to provide the impact reducing device of Fuji on both the first and second discharge port of AAPA Figures 23-24, for the purpose of reducing the amount of fluid that collides with the terminal ends of both discharge ports and reducing noise, since it has been held that mere duplication of parts has no patentable significance unless a new and unexpected result is produced. *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960).

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants' Admitted Prior Art Figures 23-24 and Sakamoto 6,443,692 and Fuji 6,336,788 as applied to

claim 2 above, and further in view of Rollwage 6,527,507. The modified impeller pump of AAPA Figures 23-24 shows all of the claimed subject matter except for a communication hole defined in the impeller that communicates between a pair of grooves defined in the first and second surface, and opposing to each other in the axial direction.

Rollwage (figures 1-3) shows a regenerative channel pump having a pump casing and an impeller 18 with communication holes 36 defined in the impeller that communicate between a pair of grooves 22 defined in a first and second surface of the impeller, and opposing to each other in the axial direction, for the purpose of providing a low or small force in the direction of the rotary axis with which the impeller is pressed against a sidewall of the casing.

It would have been further obvious at the time the invention was made to a person having ordinary skill in the art to form the modified impeller of AAPA Figures 23-24 such that the impeller includes a communication hole defined in the impeller that communicates between the pair of grooves defined in the first and second surfaces, and opposing to each other in the axial direction, as taught by Rollwage, for the purpose of providing a low or small force in the direction of the rotary axis with which the impeller is pressed against a sidewall of the pump casing.

Claims 14-16 and 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants' Admitted Prior Art Figures 23-24 and Sakamoto 6,443,692 and Fuji 6,336,788 and Rollwage 6,527,507. The rejection of claim 14 corresponds to the same grounds of rejection as

applied to claim 12 above, and reference is made to the rejection of claim 12, above. The rejection of claims 15, 16, 21, and 22 corresponds to the same grounds of rejection applied to claims 6, 4, 10, and 11, respectively, set forth above.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 2, 3, 5, 6, 10, 11, and 13 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable both over claims 1, 18, 18, 19, 18, 18, 18, and 1, respectively, of U.S. Patent No. 6,733,230 in view of Fuji 6,336,788 and Applicants' Admitted Prior Art Figures 23-24. Claim 1 of U.S. Patent 6,733,230 claims substantially the same subject matter as claims 1 and 13 of the instant application, including a rotary impeller, a pump casing defining first and second pump channels (chambers), a converging channel coupled to the first and second pump channels (which inherently will converge fluid discharged from the first pump channel and the second pump channel because the converging channel is coupled to

the first and second pump channels), and a pulsation canceling device that cancels pulsations of the fluid discharged from the first and second pump channels. The rotary impeller has first and second opposing surfaces with grooves spaced apart from each other by a predetermined pitch, a first suction port, a first discharge port, a second suction port, and a second discharge port.

However, claim 1 of U.S. Patent 6,733,230 does not claim an impact reducing device arranged and constructed to reduce impacts produced by at least one of the flow of the fluid from the first pump channel and the flow of the fluid from the second channel, and does not claim a motor section arranged and constructed to rotate the impeller. Additionally, claim 1 of U.S. Patent 6,733,230 does not claim that the pump casing further defines a first discharge port and a second discharge port respectively communicating with the first pump channel and the second pump channel and formed separately from each other, so that the fluid is discharged from the first and second channels via the respective first and second discharge ports and is converged at the convergence device. Additionally, claim 18 of U.S. Patent 6,733,230 does not claim that that the first suction port and discharge port are separated from each other by a first partition wall (claim 2), does not claim that that the second suction port and discharge port are separated from each other by a second partition wall (claim 2), and does not claim the convergence device communicating with the first discharge port and the second discharge port (claim 2).

Fuji '788 (figures 1-7) shows a regenerative channel pump having an impact reducing device 24f arranged and constructed to reduce impacts produced by flow of the fluid from a first pump channel 21 with the impact reducing device being arranged and constructed to reduce

impacts of the fluid caused by change of direction of a flow of the fluid discharged from the first pump channel toward a first discharge port 24, with an unnumbered terminal end having the part 24 opposing to grooves 16a defined in the corresponding one of first and second surfaces of the impeller 16 such that the impact reducing device is arranged and constructed to gradually reduce a sectional area of the part of the terminal end in the rotational direction of the impeller, with the impact reducing device comprising a depth decreasing region disposed at one of the terminal end of the first pump channels, with the depth decreasing region configured to gradually reduce the depth of the part of at least one of the terminal ends in the rotational direction, with the depth decreasing region comprising an inclined surface opposing to the grooves defined in the impeller, with the inclined surface being inclined in the rotational direction of the impeller, for the purpose of allowing fluid to be smoothly discharged from the discharge port, reducing the amount of fluid that collides with the terminal end of the discharge port and reducing noise. A motor section 6 is arranged and constructed to rotate the impeller, for the purpose of providing power to the impeller.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to form the impeller of claim 1 of U.S. Patent 6,733,230 such that it includes an impact reducing device of the form taught by Fuji, for the purpose of allowing fluid to be smoothly discharged from the discharge port, reducing the amount of fluid that collides with the terminal end of the discharge port and reducing noise, and to provide the impeller with a motor section arranged and constructed to rotate the impeller, as taught by Fuji, for the purpose of providing power to the impeller.

Applicants' Admitted Prior Art Figures 23-24 shows a regenerative channel pump having a pump casing 104 that defines a first discharge port 153 and a second discharge port 173 respectively communicating with a first pump channel 151 and a second pump channel 171 and formed separately from each other, so that the fluid is discharged from the first and second channels via the respective first and second discharge ports and is converged at a convergence device (the unnumbered channel within which the impeller rotates), for the purpose of allowing for discharge of fluid from the pump at multiple locations. The regenerative channel pump has the first suction port 152 and the first discharge port 153 which are separated from each other by a first partition wall 105a, with the second suction port 172 and the second discharge port 173 which are separated from each other by a second partition wall 107a, with the unnumbered convergence device in the form of a channel communicating with the first discharge port and the second discharge port, for the purpose of obtaining increased pressure from the regenerative pump.

It would have been further obvious at the time the invention was made to a person having ordinary skill in the art to form the modified impeller of claim 1 of U.S. Patent 6,733,230 such that the pump casing further defines a first discharge port and a second discharge port respectively communicating with the first pump channel and the second pump channel and formed separately from each other, so that the fluid is discharged from the first and second channels via the respective first and second discharge ports and is converged at the convergence device, as taught by Applicant's Prior Art Figures 23-24, for the purpose of allowing for

discharge of fluid from the pump at multiple locations. It would have been further obvious at the time the invention was made to a person having ordinary skill in the art to form the modified impeller of claim 18 of U.S. Patent 6,733,230 such that the first suction port and discharge port are separated from each other by a first partition wall, such that the second suction port and discharge port are separated from each other by a second partition wall, and such that the convergence device communicates with the first discharge port and the second discharge port, as taught by AAPA Figures 23-24, for the purpose of obtaining increased pressure from the regenerative pump.

Claim 4 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 18 of U.S. Patent No. 6,733,230 and Fuji 6,336,788 and Applicants' Admitted Prior Art Figures 23-24 as applied to claim 3 above, and further in view of Sakamoto 6,443,692. The modified impeller pump of claim 18 claims substantially the same subject matter as claim 4 of the instant application, but does not claim that the pulsation canceling device is arranged and constructed to displace the grooves of the impeller defined in the first surface from the grooves defined in the second surface by a half the predetermined pitch.

Sakamoto (figures 1-8) shows a regenerative channel pump having a pulsation canceling device arranged and constructed to cancel pulsations of fluid discharged from a first bottom pump channel near 6 and a second top pump channel near 6, with the pulsation canceling device being arranged and constructed to cancel pulsations of the fluid discharged from a first discharge port 34, with the pulsation canceling device being arranged and constructed to displace grooves

12 of the impeller defined in a first surface from grooves 12 defined in a second surface of the impeller by a half a predetermined pitch, for the purpose of reducing pulsations and noise.

It would have been further obvious at the time the invention was made to a person having ordinary skill in the art to form the modified impeller of claim 18 of U.S. Patent 6,733,230 such that the pulsation canceling device is arranged and constructed to displace the grooves of the impeller defined in the first surface from the grooves defined in the second surface by a half the predetermined pitch, as taught by Sakamoto.

Claim 12 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 18 of U.S. Patent No. 6,733,230 and Fuji 6,336,788 and Applicants' Admitted Prior Art Figures 23-24 as applied to claim 2 above, and further in view of Rollwage 6,527,507. The modified impeller pump of claim 18 claims substantially the same subject matter as claim 12 of the instant application, but does not claim a communication hole defined in the impeller that communicates between a pair of grooves defined in the first and second surface, and opposing to each other in the axial direction.

Rollwage (figures 1-3) shows a regenerative channel pump having a pump casing and an impeller 18 with communication holes 36 defined in the impeller that communicate between a pair of grooves 22 defined in a first and second surface of the impeller, and opposing to each other in the axial direction, for the purpose of providing a low or small force in the direction of the rotary axis with which the impeller is pressed against a sidewall of the casing.

It would have been further obvious at the time the invention was made to a person having ordinary skill in the art to form the modified impeller of claim 18 of U.S. Patent 6,733,230 such that the impeller includes a communication hole defined in the impeller that communicates between the pair of grooves defined in the first and second surfaces, and opposing to each other in the axial direction, as taught by Rollwage.

Claims 14, 15, 17, 21, and 22 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable all over claim 18 of U.S. Patent No. 6,733,230 in view of Fuji 6,443,692 and Applicants' Admitted Prior Art Figures 23-24 and Rollwage 6,527,507. The rejection of claim 14 corresponds to the same obviousness-type double patenting grounds of rejection as applied to claim 12 immediately above, and reference is made to the rejection of claim 12, above. The rejection of claims 15, 17, 21, and 22 corresponds to the same grounds of rejection applied to claims 6, 5, 10, and 11, respectively, set forth above.

Claim 16 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 19 of U.S. Patent No. 6,733,230 and Fuji 6,336,788 and Applicants' Admitted Prior Art Figures 23-24 and Rollwage 6,527,507 as applied to claim 15 above, and further in view of Sakamoto 6,443,692. The modified impeller pump of claim 19 claims substantially the same subject matter as claim 16 of the instant application, including the first and second discharge ports being disposed at the same position in the circumferential direction, but does not claim that the pulsation canceling device is arranged and constructed to

displace the grooves of the impeller defined in the first surface from the grooves defined in the second surface by a half the predetermined pitch.

Sakamoto (figures 1-8) shows a regenerative channel pump having a pulsation canceling device arranged and constructed to cancel pulsations of fluid discharged from a first bottom pump channel near 6 and a second top pump channel near 6, with the pulsation canceling device being arranged and constructed to cancel pulsations of the fluid discharged from a first discharge port 34, with the pulsation canceling device being arranged and constructed to displace grooves 12 of the impeller defined in a first surface from grooves 12 defined in a second surface of the impeller by a half a predetermined pitch, for the purpose of reducing pulsations and noise.

It would have been further obvious at the time the invention was made to a person having ordinary skill in the art to form the modified impeller of claim 19 of U.S. Patent 6,733,230 such that the grooves of the impeller defined in the first surface are offset from the grooves defined in the second surface of the impeller by a half the predetermined pitch, as taught by Sakamoto, for the purpose of reducing pulsations and noise.

Applicant's amendment necessitated the new ground(s) of rejection (in the obviousness-type double patenting rejections) presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Verdier whose telephone number is (571) 272-4824. The examiner can normally be reached on Monday-Friday from 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward K. Look can be reached on (571) 272-4820. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C.V.
March 27, 2006

Christopher Verdier
Primary Examiner
Art Unit 3745